

**REMARKS**

The Office action mailed on 23 July 2004 (Paper No. 0504) has been carefully considered. Allowance of claims 7, 29 and 57-67, as stated in paragraph 32 of the Office action, is appreciated.

Claims 54, 71 and 75 are being canceled without prejudice or disclaimer, claims 12, 17, 21, 36, 39 thru 41, 48 thru 53, 55 thru 70, 72 thru 74 and 76 thru 78 are being amended, and claim 79 is being added. Thus, claims 7, 10, 12, 16, 17, 20 thru 22, 29, 36 thru 53, 55 thru 70, 72 thru 74 and 76 thru 79 are pending in the application.

In paragraph 2 of the Office action, the Examiner stated that our traversal of the restriction requirement set forth in the previous Office action is not persuasive. The Examiner maintained the restriction requirement and made it final. Applicants renew their traversal of the restriction requirement for the reasons previously stated.

In paragraph 4 of the Office action, the Examiner objected to claims 36, 39 thru 41 and 47 for dependency upon an improper claim. By this Amendment, claims 36 thru 47 are being made dependent (directly or indirectly) from independent method claim 78.

In paragraph 6 of the Office action, the Examiner rejected claims 48 thru 50 under 35 U.S.C. §112 (second paragraph) for lack of antecedent basis. These claims are being

amended to eliminate the lack of antecedent basis.

In paragraph 9 of the Office action, the Examiner rejected claims 10, 16, 51, 53, 55, 68, 70, 72, 74 and 76 under 35 U.S.C. §102 for alleged anticipation by Koizumi, U.S. Patent No. 5,216,320. In paragraph 21 of the Office action, the Examiner rejected claims 20 thru 22, 52, 56, 69, 73 and 77 under 35 U.S.C. §103 for alleged unpatentability over Koizumi '320 in view of Saito *et al.*, U.S. Patent No. 6,124,666. In paragraph 33 of the Office action, the Examiner objected to claims 48 thru 50, but stated that these claims would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C. §112 (second paragraph) stated above. The Examiner also objected to claims 12, 17, 54, 71 and 75 for dependency upon a rejected base claim, but stated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. For the reasons stated below, it is submitted that the invention recited in the claims, as now amended, is distinguishable from the prior art cited by the Examiner so as to preclude rejection under 35 U.S.C. §102 or §103.

Independent claim 10 is distinguishable from the prior art cited by the Examiner, and in particular, from the disclosure of Koizumi '320, on the grounds that, as recited in the claim, the electro-emitting material layer has "a surface roughness corresponding to a distance between a highest point and a lowest point on a surface of the electron-emitting material layer being less than 10 microns" (quoting from the last three lines of claim 10).

Such a feature is not disclosed or suggested in Koizumi '320, or in any other prior art cited by the Examiner.

In paragraph 10 on page 4 of the Office action, the Examiner states that, "[s]ince the electron-emitting material layer is shown having a flat, smooth surface, the Examiner notes that the layer has a surface roughness of zero microns, which is less than 10 microns" (quoting from page 4, lines 6-9 of the Office action). Applicants respectfully disagree with this statement of opinion by the Examiner.

It should first be noted that Figure 1 of Koizumi '320 is not a very detailed diagram, but rather resembles a general sketch of the disclosed cathode for electron tube. More importantly, the electron emissive layer 3 is shown in very little detail, that is, in general form, so that one cannot conclude one way or the other whether the surface of the layer 3 has a particular degree of roughness. The latter proposition is supported by the fact that Koizumi '320 is completely silent as to any degree of roughness for the layer 3. In that regard the electron emissive material layer 3 is mentioned and described at column 5, lines 41-64 of the patent, and is also mentioned in the section at column 5, line 65 - column 6, line 22 of the patent. However, at no point in the aforementioned sections of the patent, or in the patent in general, is there any mention of any degree of surface roughness of the electron emissive material layer 3.

Thus, it is respectfully submitted that the Examiner is reading more into the disclosure of Koizumi '320 than is actually there. If the disclosure of Koizumi '320 stated that the surface of the layer 3 was "smooth" or "relatively smooth", perhaps one could draw the conclusion that the surface roughness of the layer 3 was less than 10 microns. However, since the disclosure of Koizumi '320 is completely silent as to any degree of roughness for the layer 3, it is unreasonable to read into the disclosure of Koizumi '320 any degree of smoothness or roughness for the material layer 3. Thus, Koizumi '320 does not disclose or suggest the feature recited in the last three lines of claim 10. For that reason, it is submitted that the invention recited in claim 10 is allowable over the prior art.

Dependent claim 12 is being amended to appear in independent form, including the recitations from preceding independent claim 10. Similarly, dependent claim 17 is being amended to appear in independent form, including the recitations from preceding independent claim 10. Since the Examiner indicated that dependent claims 12 and 17 were merely objected to for dependency upon a rejected base claim, it is submitted that independent claims 12 and 17 should now be in condition for allowance.

Independent claim 51 is being amended to include the recitations from dependent claim 54, which is being canceled. Since the Examiner indicated that dependent claim 54 was merely objected to for dependency upon a rejected claim, it is submitted that independent claim 51 and its associated dependent claims should now be in condition for

allowance.

Dependent claim 56 is being amended to appear in independent form, including the recitations from preceding independent claim 51. In addition, dependent claim 56 is being amended to recite that the “layer of electron-emitting material” (rather than the “metal base”) has a thickness in a range of 30 microns to 80 microns. In that regard, Koizumi ‘320 does not disclose or suggest an arrangement wherein the electron-emitting material has a thickness in a range of 30 microns to 80 microns. Rather, Koizumi ‘320 states that the barium scandate particles making up the electron emissive material layer 3 are in the shape of rod-formed crystal having a thickness of about 2 microns. Thus, the thickness does not fall within the range recited in claim 56. Furthermore, in paragraph 36 on page 7 of the Office action, with respect to claims 7, 17 and 29, the Examiner stated that the prior art of record does not show “a thickness of the electron-emitting material layer being in a range of 30 to 80  $\mu\text{m}$ ” (quoting from page 8, lines 1-2 of the Office action). For these reasons, it is submitted that the invention recited in amended claim 56 is distinguishable from the prior art so as to preclude rejection under 35 U.S.C. §102 and §103, and thus claim 56 should now be in condition for allowance.

Allowed independent claim 57 is being amended for the purpose only of improving its form. Thus, the amendment of claim 56 should not adversely affect the allowance of independent claim 57 and its associated dependent claims.

Similarly, allowed independent claim 63 is being amended for the purpose only of improving its form. Thus, the amendment should not adversely affect the allowability of independent claim 63 and its associated dependent claims.

Independent claim 68 is being amended to include the recitations from dependent claim 71, which is being canceled. Since the Examiner indicated that dependent claim 71 was merely objected to for dependency upon a rejected base claim, independent claim 68 and its associated dependent claims should now be in condition for allowance.

Independent claim 72 is being amended to include the recitations from dependent claim 75, which is being canceled. Since the Examiner indicated that dependent claim 75 was merely objected to for dependency upon a rejected base claim, independent claim 72 and its associated dependent claims should now be in condition for allowance.

Dependent claim 77 is being amended to appear in independent form, including the recitations from preceding independent claim 72. It is submitted that amended claim 77 distinguishes the invention from the prior art cited by the Examiner on the grounds that the prior art, and in particular Koizumi '320, does not disclose or suggest "a layer formed on said base from a carbonate paste comprising a barium-based carbonate electron-emitter and a needle-shaped electrically conductive powder", said layer having a "thickness in a range of 30 microns to 80 microns", as recited in claim 77, as amended. Thus, amended claim 77

should now be in condition for allowance on the same basis that previously discussed claim 56 is in condition for allowance. In that regard, *see* the discussion above relative to claim 56.

By this Amendment, four (4) independent claims are added. Therefore, this application now contains total of fourteen (14) independent claims, that is, claims 7, 10, 12, 17, 29, 48, 51, 56, 57, 63, 68, 72, 77 and 78. During the prosecution of this application, Applicant, so far, has paid the fee for total nine (9) independent claims. Accordingly, Applicant encloses a fee of \$440.00 for five (5) independent claims in excess of total 10. Applicant's check drawn to the order of Commissioner accompanies this Amendment. Should the check become lost, be deficient in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

In view of the above, it is submitted that the claims of this application are in condition for allowance, and early issuance thereof is solicited. Should any questions remain unresolved, the Examiner is requested to telephone Applicant's attorney.

Respectfully submitted,



Robert E. Bushnell,  
Attorney for the Applicant  
Registration No.: 27,774

1522 "K" Street N.W., Suite 300  
Washington, D.C. 20005  
(202) 408-9040

Folio: P56533  
Date: 10/15/04  
I.D.: REB/JGS